

OBSERVATIONS ON THE BIOLOGY OF THE NEOTROPICAL KATYDID *HAEMODIASMA* *TESSELATA* (ORTHOPTERA: TETTIGONIIDAE)¹

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ABSTRACT: Ecological observations of activity and the feeding of the arboreal katydid *Haemodiasma tesselata* on frog embryos are reported for a montane wet forest site in Costa Rica.

The large, lichen-patterned *Haemodiasma tesselata* Brunner, 1895 is among the more striking pseudophylline katydids. Beier (1963) reported it from Panama, and it also has been found at Finca Las Cruces, Provincia de Puntarenas, Costa Rica. It is recognized as a member of the tribe Pleminiini in having a strongly transverse mesosternum and a produced anterior margin to the pronotum. *Haemodiasma* Brunner is distinguished by having all femora dorsally unarmed, with broadly rounded and unarmed genicular lobes, and the front femora longer than the pronotum. The genus includes two species, *H. tesselata* from Central America and *H. pulchra* from Bolivia. The pseudophylline katydids are a group that apparently scavenge on the particulate "rain" from the canopy of Neotropical forests (Rentz, 1975), but the biology of *H. tesselata*, until now, has been completely unknown. We report the following observations.

Observations were made by MPH between 23 April 1982 and 26 April 1983 along the Río Guacimal, a small stream which flows through the highland community of Monteverde in the Cordillera de Tilarán of northwestern Costa Rica. The site is at ca. 1400 m elevation and is transitional between tropical pre-montane and lower montane wet forest life zones of the Holdridge life zone system (Hartshorn, 1983). Most observations were made at night between 1900 and 0500 hrs (Central Standard Time).

Haemodiasma tesselata was rarely seen at the study site, which was used primarily for nocturnal field work on frogs. During 13 months, MPH encountered this katydid only 15 times. DCFR collected only one during the course of two trips to the same locality. *H. tesselata* was encountered 13 times at night wandering on broadleaf vegetation between 1.5 m and 3 m above the ground. It may occur higher than this, but few observations were made above 3 m. No particular effort was made to search for *H. tesselata*

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during the day, but two individuals were encountered immobile and resting on the trunks of large trees. Their mottled green and brown coloration made them cryptic and initially difficult to distinguish on the lichen-covered bark.

Two observations of feeding of different adult female *H. tessellata* were recorded. Both instances occurred at night between 2200 and 2300 hr. In one case, a katydid was found eating the jelly-encapsulated seeds of an unidentified plant that was found on the surface of a leaf of a small shrub; in the other case, an *H. tessellata* was found eating the jelly-encapsulated embryos of a glass-frog, *Centrolenella fleischmanni* (Boettger, 1893) (Centrolenidae), that had been deposited on the inferior surface of a vertically oriented leaf of *Hedychium coronarium* Koenig in Retz., 1783 (Zingiberaceae). Members of the genus *Centrolenella* are obligately riparian, depositing eggs on vegetation overhanging freshwater streams (Starrett and Savage, 1973). Another orthoperan, the gryllid *Paroecanthus tibialis* Saussure, 1897, has been reported to prey upon embryos of *C. fleischmanni* at this site (Hayes, 1983).

The female *H. tessellata* preying on *C. fleischmanni* embryos consumed within six minutes an entire clutch containing 23 late-cleavage embryos, and was little impeded by the presence of a relatively well-hydrated clutch jelly, 2-4 mm thick. By contrast, *P. tibialis* was an inefficient predator, requiring 20 minutes just to break through a single jelly capsule and never consuming more than 25% of the embryos in each of three clutches (Hayes, 1983). In each of these cases, the clutch jelly was thin (poorly hydrated), a condition which may allow easier access to embryos (Hayes, unpubl. data). Compared to the gryllid, *H. tessellata*'s larger size (body length > 60 mm) and mouthparts, and its better-developed, gripping tarsal pads (characteristic of many pseudo-phyllines; see Morris and Beier, 1982 and Rentz, 1975) are features that seem to make it more efficient at feeding aboreally on prey found on smooth leaves such as centrolenid embryos. By contrast, the less specialized tarsal morphology (Hayes, pers. observ.), and smaller size (body length ca. 30 mm) and mouthparts of *P. tibialis* make it less efficient under these same conditions (Hayes, 1983). The single observation of predation by *H. tessellata* on the seasonally abundant embryos of leaf-breeding glass frogs may be a function of this katydid's rarity in the low, riparian vegetation layer; by contrast, *P. tibialis* was encountered by MPH over 20 times as frequently as *H. tessellata* in this stratum at Monteverde. That both instances of feeding by *H. tessellata* involved jelly-encapsulated food items seem coincidental because nothing obvious in this katydid's biology suggests that it would specialize on such food items. However, *H. tessellata* females may actively seek out protein-rich food, such as frog embryos (Villa, 1983), because such foods can make greater contributions to the development of eggs that females carry.

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BOOKS RECEIVED AND BRIEFLY NOTED

CLADISTIC ANALYSIS OF NORTH AMERICAN PLATYNINI AND REVISION OF THE *AGONUM EXTENSICOLLE* SPECIES GROUP (COLEOPTERA: CARABIDAE). J.K. Liebherr. 1986. Univ. of Calif. Press. 198 pp. \$16.95.

Cladistic analysis based on internal male and female reproductive characters and external characters is used to group exemplar taxa in the carabid tribe Platynini. A classification, key to genera in North America, and a key to species groups of *Agonum* in North America north of Mexico are presented.

SPIDERS: WEBS, BEHAVIOR, AND EVOLUTION. W.A. Shear, ed. 1986. Stanford Univ. Press. 492 pp. \$55.00.

Thirteen chapters written by sixteen arachnologists present an up-to-date summary of what is known of the relationships of spiders to their webs, and the light cast by those relationships on the evolution of spiders. Included is a discussion on whether web-building spiders evolved from hunting spiders or vice versa.